PHASE II RI/FS WORK PLAN FOR THE MEDLEY FARM SITE GAFFNEY SOUTH CAROLINA

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(REV. 01)

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* Includes final response to Agency comments

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1.0 INTRODUCTION

This Work Plan has been prepared by Sirrine Environmental Consultants (Sirrine) for the performance of Phase II Remedial Investigations (RI) at the Medley Farm Superfund Site ("the Site"). A draft report which presents the results of Phase I Remedial Investigations was submitted to EPA Region IV in March, 1990. The Agency's comments on the Draft RI Report were provided to the Steering Committee on May 15, 1990. Based upon consideration of these comments and initial Risk Assessment (RA) and Feasibility Study (FS) activities, this Work Plan has been developed to present a program to gather additional data required to complete the evaluation of potential risks associated with the site and to provide sufficient data to support the selection of the most cost effective permanent remedy for the Site. This is consistent with the provision for a Phase II RI in the approved Project Operations Plan (POP) for this site (See p. 17 of POP, Sirrine, January 1989).

This RI/FS is being performed under an Administrative Consent Order from EPA Region IV signed in January 1988.

1.1 PURPOSE AND SCOPE

The purpose of this Work Plan is to provide a detailed Scope of Work and rationale for Phase II Remedial Investigations of the Medley Farm Site. A schedule for implementation of the work described is also included.

This document supplements the RI/FS Work Plan (Sirrine, August 1988) and Project Operations Plan (Sirrine, January 1989) approved by the Agency for this project.

1.2 OVERVIEW

The Medley Farm Site is approximately 7 acres of the Ralph Medley farm property located in a rural section of Cherokee County, 6 miles south of Gaffney, South Carolina. The Site is currently ranked 850 out of 989 sites on the National Priority List (55 Federal Register 9688). Prior to the mid-1970s, the Site was maintained as woods and pasture land. Waste disposal reportedly began at the site in 1973 and ended in June, 1976. At the time of the South Carolina Department of Health and Environmental Control (SCDHEC) inspection in 1983, 55-gallon drums and smaller plastic containers were stored on-site in a random fashion. These containers were scattered in the open portion of the site and in six small lagoon areas. No formal records of disposed waste materials were maintained at the Site.

During late spring and early summer of 1983, waste materials were removed from the Site under an immediate removal action directed by EPA, pursuant to Section 104 of CERCLA. A total of 5,383 55-gallon and 15-gallon containers were removed from the Site. Approximately 70,000 gallons of water were collected from six small lagoons, treated using sand filtration and carbon adsorption, and discharged to Jones Creek. Approximately 2,132 cubic yards of solid waste, lagoon sludge, and surficial soils were removed from the Site. The lagoons were then backfilled with clean soils or graded to the surrounding topography. Analytical testing of solid and liquid waste materials indicated that the primary chemical constituents consisted of volatile organic compounds. These included toluene, benzene, methylene chloride, tetrachloroethylene and vinyl chloride.

Phase I Remedial Investigation field activities were performed during the period of October 1988 to January 1990.

1.3 SUMMARY OF PHASE I RI SAMPLING AND ANALYSES

The Phase I RI field investigations were subdivided into Phase IA and Phase IB. The results of sampling and analyses conducted during Phase IA were used to develop a list of site specific indicator parameters which were used for analyses performed on samples collected during Phase IB. Indicator parameters were selected to be representative of the most toxic, mobile and persistent chemicals at the site as well as those present in the larger amount. Indicator parameter chemicals were approved by EPA prior to Phase IB sampling.

RI Phase IA Field Investigations included:

- A passive soil gas survey to confirm the selection of appropriate locations for source characterization efforts;
- Excavation of 10 test pits for initial source characterization;
- Installation of seven monitoring wells for ground-water sampling and water level measurement;
- Ground-water sampling of four wells: SW3, SW4, BW2, and BW4; and,
- Hydraulic testing (water pressure tests) of three open hole bedrock wells (BW2, BW3 and BW4).
- Chemical analyses performed during the Phase IA of the Remedial Investigation included complete TCL and TAL analyses of four ground-water samples and eight soil/waste samples collected from test pits at suspected lagoon sites. TCL/TAL analyses include volatile organic compounds (VOC), semi-volatile organic compounds (SVOCs), pesticides, PCBs and inorganic compounds.

RI Phase IB Field Investigations included:

- Ten soil borings for additional source characterization and evaluation of background soil characteristics;
- Six additional test pits;
- Surface water and stream sediment sampling;
- Ground-water sampling of all monitoring wells; and,
- Hydraulic testing (slug tests of all wells).
- Chemical analyses performed during Phase IB of the RI included analyses of: seven ground-water samples for VOCs, four stream sediment, and four surface water samples for VOCs and SVOCs, 30 soil samples from soil borings for VOCs and SVOCs, and six soil samples from test pits for VOCs and SVOCs. In addition to these indicator parameter analyses, three background soil samples were analyzed for inorganic compounds and pesticides. Ground-water samples from each of the two background wells were also analyzed for inorganic compounds in addition to VOCs and SVOCs. Although there is no evidence that dioxins were stored or disposed of at the site, one composite soil sample was subjected to dioxin analyses during Phase IV as required by EPA.

All chemical analyses performed during the Phase I RI were performed by an EPA-certified CLP (Contract Laboratory Program) laboratory according to strict CLP protocols. Phase I RI sampling locations are shown on Figure 1.1.

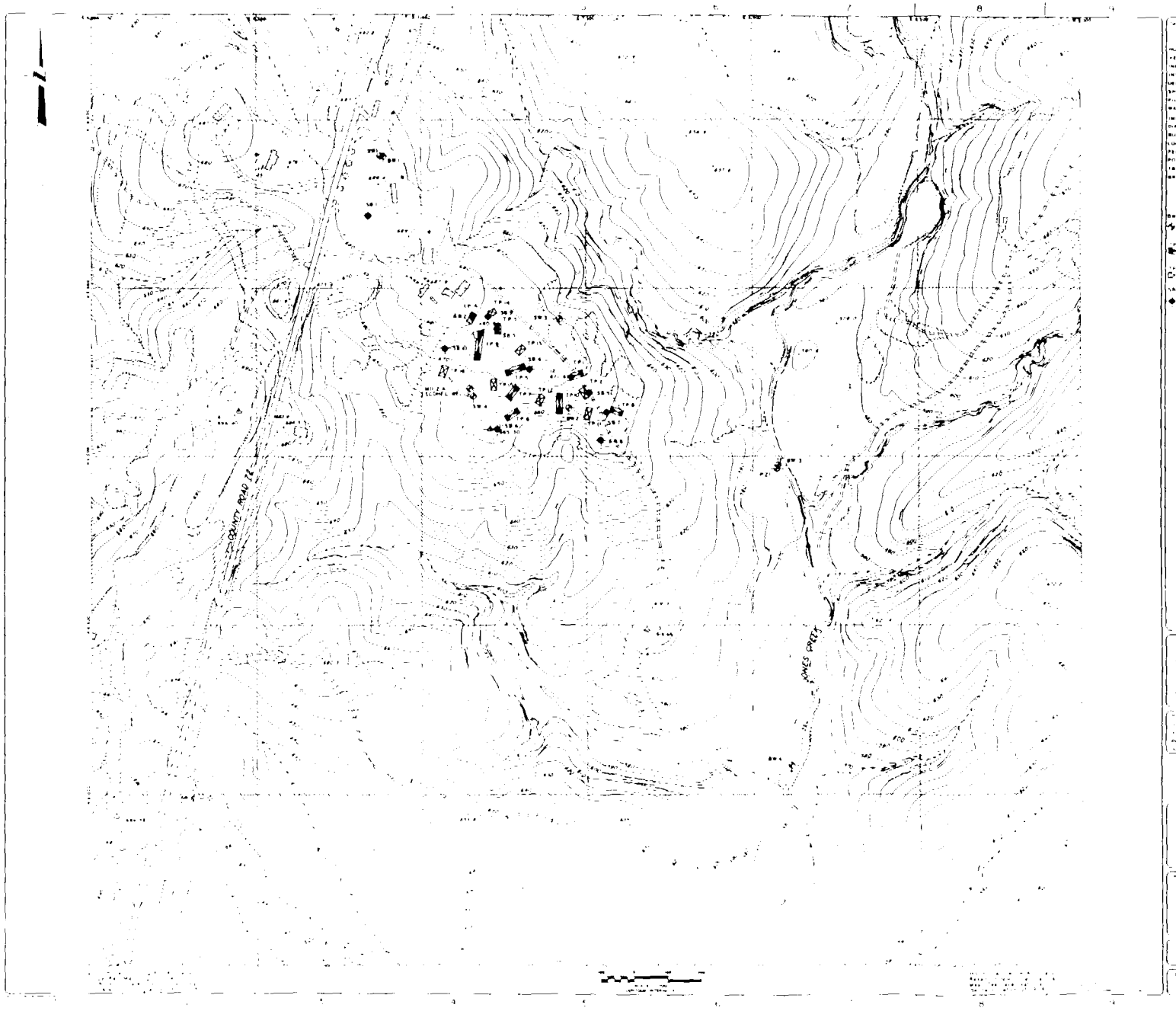
COUNTY ROAD 12
JONES CREEK
SIRRINE ENVIRONMENTAL CONSULTANTS
Mallory Farm Site
Remedial Investigation
Feasibility Study
Overall Subsurface
Exploration Locations

Figure 1.1

The following conclusions were drawn from the results of the Phase I RI:

- Contaminants are present at the Site in soils in the immediate vicinity of the disposal area and in ground water of the saprolite and bedrock aquifers beneath the Site.

- Contaminants present in soils are related to distinct, localized, primarily shallow source areas of direct disposal (lagoons or drum disposal areas).

- Contaminants detected in soils consist primarily of VOCs and SVOCs.

- Overland movement/transport of contaminants away from the immediate disposal areas of the site is not currently occurring.

- No contaminants were detected in analyses of surface water and stream sediments collected from Jones Creek.

- Residual source materials consist of thin, isolated pockets of sludges and debris located at former lagoon sites. This material was typically encountered at depths of 0.5 to two feet below ground surface.

- The only contaminants detected in ground water at the site consist of VOCs. These contaminants were only detected downgradient of the source area.

- Inorganic constituents were detected at what we believe to be background levels. The agency's comments on the draft RI Report, however, questioned this conclusion.

- Chemical analyses of ground-water samples collected from background wells (saprolite and bedrock) installed between the Medley Farm site and the Sprouse domestic well showed no contaminants.

- Contaminants detected in ground water have not reached the closest perennial discharge area (Jones Creek, located to the southeast and east of the site). VOCs were not detected in monitoring wells installed immediately west of Jones Creek.

- Ground-water yields from the bedrock aquifer are significantly higher than in the saprolite aquifer. Based on the topography of the site, it appears that there are radial components to the ground-water flow with a dominant direction of flow to the southeast. Vertical gradients at the site are slight and appear to be insignificant. A steep horizontal gradient to the southeast is present.

- The Phase II RI included in the Site Work Plan and POP is necessary to address questions raised by the Phase I RI.

1.4 PHASE II RI OBJECTIVES

The Phase I RI provided an initial characterization of hydrogeologic conditions at the Medley Farm Site and identification of contaminants associated with former disposal activities. Based upon evaluation of the data obtained from the Phase I RI activities, it appears that the Phase II RI activities provided for inthe POP are needed. Phase II RI activities will focus on gathering data required to evaluate potential risks associated with the Site contaminants, the fate of the contaminants in the environment, potential receptors,and the degree of interconnection between the saprolite and bedrock aquifers. The Phase II activities will also be used to confirm that metal concentrations in upgradient wells represent background levels in the area and to confirm that any contamination at the Site is not moving with ground water in the direction of the Sprouse well.

The specific objectives of th4e Phase II RI are to:

- Determine the concentrations of contaminants in surface soils to provide data required to complete risk assessment calculations with respect to dermal exposure and ingestion of soils;

- Refine the delineation of the former disposal areas to complete the Risk Assessment and provide the necessary analysis of alternative remedies in the Feasibility Study;

- Complete the evaluation of the hydraulic relationships between the bedrock and saprolite aquifers at the Site so that the feasibility and effectiveness of treating the saprolite and bedrock aquifers as a single unit and preventing the movement of additional contamination from the saprolite aquifer into the bedrock aquifer can be assessed;

- Provide additional characterization of the horizontal and vertical extent and concentrations of contaminants in the saprolite and bedrock aquifers beneath the Site;

- Confirm ground-water flow patterns for purposes of the Risk Assessment to substantiate that the nearby domestic water supply well (the Sprouse well) has not been impacted by former disposal activities at the Site;

- Provide additional characterization of background levels of inorganic constituents in ground water and soils at the Site to confirm that inorganics are not associated with former Site disposal activities;

- Confirm ground-water discharge areas.

2.0 OVERVIEW OF PROPOSED PHASE II RI ACTIVITIES

2.1 DATA QUALITY OBJECTIVES

3 4 0213

Data Quality Objectives (DQOs) are based on the concept that different data uses may require different data quality. Two (2) levels of analytical data quality, as summarized on Table 4-3 of the document Data Quality Objectives for Remedial Response Activities (EPA 540/G-87/003), will be generated and utilized during the Phase II RI:

- Level III. This level of analytical data quality will be utilized for analyses used to supplement overall characterization of residual chemical concentration in ground water and to determine the final locations of additional monitoring wells which will be installed during the Phase II RI. This will involve the analyses of ground-water samples for TCL volatile organics requiring rapid turnaround using routine laboratory QA/QC.

- Level IV (confirmational). This analytical data quality level requires full Contract Laboratory Program (CLP) analytical and data validation procedures. All soils analyses, water supply analyses, and analyses of ground-water samples collected from monitoring wells during Phase II will be analyzed following CLP procedures.

2.2 SUMMARY OF PROPOSED FIELD ACTIVITIES AND CHEMICAL ANALYSES

The type and quantities of field activities proposed for the Phase II RI are presented on Table 2.1. The corresponding sampling and analytical program is summarized on Table 2.2. This program includes the rapid analyses of ground-water samples collected from the saprolite aquifer using a Hydropunch™ and from discreet intervals in the fractured bedrock using a Teflon and stainless steel bladder pump mounted between pneumatic packers. These ground-water samples will be analyzed at a local state-certified laboratory on a 24

TABLE 2.1

SUMMARY OF PROPOSED PHASE II FIELD ACTIVITIES FOR THE MEDLEY FARM SITE REMEDIAL INVESTIGATION

3 4 0214

ACTIVITY	QUANTITY
• Near Surface (0 to 24 inches) Soil Sampling	12 or 15
• Saprolite Well Installation	up to 6
• Bedrock Well Installation (Bedrock will be cored at each location)	3 to 7
• Hydraulic Testing	
- Slug Tests (Saprolite Wells)	2 to 5
- Water Pressure Tests (Bedrock Wells)	3 to 10+
• Ground-water Sample Collection With Hydropunch™	4
• Ground-water Sample Collection From Discrete Fracture Zones in Bedrock	6 to 10+
• Ground-water Sample Collection From Completed Monitoring Wells	7 to 14
• Physical Soil Analyses	
- Moisture Content	10 to 20
- Grain Size Analyses	5 to 10
- Atterberg Limit Determinations	10 to 20

TABLE 2.2

SUMMARY OF PROPOSED PHASE II CHEMICAL ANALYSES FOR THE MEDLEY FARM SITE REMEDIAL INVESTIGATION

		ANALYTICAL REQUIREMENTS	
SAMPLE MATRIX/TYPE	NUMBER OF ANALYSES	ANALYTICAL FRACTION	ANALYTICAL LEVEL QA/QC
Near Surface Soil	12	TCL Volatile Organics	IV / CLP
	12	TCL Semi-Volatile Organics	IV / CLP
	3	TAL Inorganics	IV / CLP
Hydropunch™/ Ground-water	4	TCL Volatile Organics	III / Non-CLP
Discrete Interval/ (Bedrock Aquifer) Ground-water	3	TCL Volatile Organics	III / Non-CLP
Monitoring Well/ Ground-water	12 to 20	TCL Volatile Organics	IV / CLP
	2	TAL Inorganics (filtered)	IV / CLP

NOTES:

1. Refers to analytical levels and associated QA/QC requirements as described in the EPA guidance document Data Quality Objectives for Remedial Response Activites (March 1987)

to 48 hour turnaround basis for TCL volatile organic compounds using routine laboratory QA/QC procedures. This information will be utilized to determine the location and depth of additional monitoring wells from which ground-water samples will be collected and analyzed in accordance with CLP procedures.

2.3 RATIONALE FOR PROPOSED ANALYSES

The proposed analyses discussed in the following sections include analyses for substantiation of background concentrations of inorganic compounds in soils and ground water. These analyses have been included due to concerns expressed by the Agency during the Phase I RI draft review meeting (EPA - Atlanta, June 8, 1990). We understand that EPA is reviewing the need for these analyses based upon our recent submittal of revised tables which provide a complete summary of the concentrations of inorganic compounds detected in soil and ground-water samples analyzed during Phase I of the RI. Based upon our evaluations of this data we have concluded that there is no indication of the presence of inorganic contaminants associated with former disposal activities at the site. Additional inorganic analyses will not be performed during Phase II if EPA concurs with this conclusion.

2.3.1 Soils Analyses

Twelve near surface soil samples will be collected and analyzed for TCL volatile and semi-volatile organic compounds. This information will be used to quantify potential risks associated with direct contact to contaminants which may be present in surface soils and the potential intake of contaminants by wildlife through the ingestion of such soils.

Based upon evaluation of the Phase I analytical data and sampling program, significant levels of PCBs, pesticides and inorganics are not present in soils at the

site. Samples collected from test pits were collected specifically for the characterization of residual source materials remaining at the site. These composite samples were selected based upon visual assessment and field screening using an Organic Vapor Analyzer (OVA). These composite samples included portions of any residual sludges, stained soils or soils which responded to the OVA.

Although the PCB Aroclor 1254 was detected in 7 of the 9 test pit samples analyzed for PCBs, concentrations ranged from 0.667 mg/kg at TP1 to a maximum of 5.379 mg/kg at TP2. These levels are well below the 10 ppm clean-up level established by EPA for non-restricted access areas. The only other PCB compound detected consisted of Aroclor-1260 which was detected in one sample (TP4) at a level of 0.594 mg/kg. Detected concentrations of pesticides consisted of trace levels of 3 compounds detected in 3 of the 9 samples analyzed. The results of pesticide/PCB analyses are presented on Table 2.3. This data will be used for purposes of the Risk Assessment.

We believe Phase I data indicate that levels of inorganics present in soils within the former disposal area are consistent with local background conditions. This information is summarized on Tables 2.4 and 2.5. However, if required to address Agency concerns, three additional near surface soil samples will be collected from undisturbed areas of the site and subjected to TAL inorganic analyses.

2.3.2 Ground Water Analyses

One complete round of ground-water samples will be collected from all new wells installed during the Phase II RI and from the existing wells installed during the Phase I RI. These samples will be analyzed for TCL volatile organic compounds. The results of Phase I ground-water analyses indicate that these are the only residual chemicals impacting ground water at the site. No semi-volatile organic compounds,

pesticides or PCBs were detected above Sample Quantitation Limits (SQLs) in any of the ground-water samples analyzed during Phase I.

Elevated levels of metals observed in ground water are restricted to iron, aluminum and manganese. These elements are ubiquitous to the local bedrock and saprolite, and are consistent with levels of these constituents observed in soils. If necessary to address Agency concerns, however, an additional set of ground-water samples will be collected from the existing background wells (SW1 and BW1) during Phase II. These samples will be filtered in the field prior to the addition of the required preservatives, and will then be submitted for the analysis of TAL inorganic to substantiate background levels of inorganic compounds in ground water.

Tables 2.6 and 2.7 present a comparison of inorganic concentrations detected in ground-water samples collected from the site during the Phase I RI.

TABLE 2.3
MEDLEY FARM SITE RI PHASE IA
TEST PIT SOILS ANALYTICAL RESULTS
PESTICIDES/PCBs (ug/kg)

SAMPLE ID COMPOUND	TP1-1	TP2-1	TP3-1	TP3-1 DL	TP4-1	TP5-1	TP5-1A	TP7-1	TP8-1	TP9-1	TP10-1
alpha-BHC	8.4 U	17 U	4.2 U	21 U	4.1 U	8.3 U	8.3 U	8.3 U	41 U	9.4 U	11 U
beta-BHC	8.4 U	17 U	4.2 U	21 U	4.1 U	8.3 U	8.3 U	8.3 U	41 U	9.4 U	11 U
delta-BHC	8.4 U	17 U	4.2 U	21 U	4.1 U	8.3 U	8.3 U	8.3 U	41 U	9.4 U	11 U
gamma-BHC (Lindane)	8.4 U	17 U	4.2 U	21 U	4.1 U	8.3 U	8.3 U	8.3 U	41 U	9.4 U	11 U
Heptachlor	8.4 U	17 U	4.2 U	21 U	4.1 U	8.3 U	8.3 U	8.3 U	41 U	9.4 U	11 U
Aldrin	8.4 U	17 U	4.2 U	21 U	4.1 U	8.3 U	8.3 U	8.3 U	41 U	9.4 U	11 U
Heptachlor epoxide	8.4 U	17 U	4.2 U	21 U	4.1 U	8.3 U	21	8.3 U	41 U	9.4 U	46
Endosulfan I	8.4 U	17 U	4.2 U	21 U	4.1 U	8.3 U	8.3 U	8.3 U	41 U	9.4 U	11 U
Dieldrin	17 U	34 U	8.4 U	42 U	8.2 U	30	61	17 U	82 U	19 U	22 U
4,4'-DDE	17 U	34 U	8.4 U	42 U	8.2 U	17 U	17 U	17 U	82 U	19 U	22 U
Endrin	17 U	34 U	8.4 U	42 U	8.2 U	17 U	17 U	17 U	82 U	19 U	22 U
Endosulfan II	17 U	34 U	8.4 U	42 U	8.2 U	17 U	17 U	17 U	82 U	19 U	22 U
4,4'-DDD	17 U	34 U	8.4 U	42 U	8.2 U	17 U	17 U	17 U	82 U	19 U	22 U
Endosulfan sulfate	17 U	34 U	8.4 U	42 U	8.2 U	17 U	17 U	17 U	82 U	19 U	22 U
4,4'-DDT	17 U	34 U	8.4 U	42 U	8.2 U	17 U	17 U	17 U	82 U	19 U	22 U
Methoxychlor	84 U	170 U	42 U	210 U	41 U	83 U	83 U	83 U	410 U	94 U	110 U
Endrin ketone	17 U	34 U	8.4 U	200 D	8.2 U	17 U	17 U	17 U	82 U	19 U	22 U
alpha-Chlordane	84 U	170 U	42 U	210 U	41 U	53 J	83 U	83 U	410 U	94 U	110 U
gamma-Chlordane	84 U	170 U	42 U	210 U	41 U	83 U	83 U	83 U	410 U	94 U	110 U
Toxaphene	170 U	340 U	84 U	420 U	82 U	170 U	170 U	170 U	820 U	190 U	220 U
Aroclor-1216	84 U	170 U	42 U	210 U	41 U	83 U	83 U	83 U	410 U	94 U	110 U
Aroclor-1221	84 U	170 U	42 U	210 U	41 U	83 U	83 U	83 U	410 U	94 U	110 U
Aroclor-1232	84 U	170 U	42 U	210 U	41 U	83 U	83 U	83 U	410 U	94 U	110 U
Aroclor-1242	84 U	170 U	42 U	210 U	41 U	83 U	83 U	83 U	410 U	94 U	110 U
Aroclor-1248	84 U	170 U	42 U	210 U	41 U	83 U	83 U	83 U	410 U	94 U	110 U
Aroclor-1254	667	5379	84 U	420 U	82 U	1003	1955	881	820 U	190 U	2442
Aroclor-1260	170 U	340 U	84 U	420 U	594	170 U	170 U	170 U	820 U	190 U	220 U
Date Collected	02/22/89	02/22/89	02/20/89	02/20/89	02/16/89	02/23/89	02/23/89	02/22/89	02/23/89	03/07/89	03/07/89
Date Extracted	03/01/89	03/01/89	03/01/89	03/01/89	02/17/89	03/02/89	03/02/89	03/01/89	03/02/89	03/11/89	03/11/89
Date Analyzed	03/16/89	03/16/89	03/14/89	03/14/89	03/14/89	03/24/89	03/24/89	03/17/89	03/24/89	03/24/89	03/24/89

TABLE

COMPARISON OF BACKGROUND CONCENTRATIONS (mg/kg) OF INORGANICS IN SOIL
AT THE MEDLEY FARM SITE WITH COMMONLY OCCURRING RANGES

INORGANICS	PHASE IA TEST PITS TP1	TP2	TP3	TP4	TP5	TP7	TP9	TP10	COMMON RANGE OF ELEMENTS IN SOIL - LINDSAY (1979) RANGE	SELECTED AVERAGE	ELEMENT CONC. IN SOILS - EASTERN U.S. - USGS (1984)
Ag	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	0.01-5	0.05	–
Al	21,000(b)	13,700(b)	13,900(b)	10,300(b)	7830(b)	12,200(b)	20,200	16,300(b)	10,000-300,000	71,000	4.7%
As	30.6	9.8	20.2	19.8	BDL(a)	28.3	41.1	13.8	1-50	5	5.2
Ba	58	315	BDL(a)	BDL(a)	105	86.9	72.8	272	100-3,000	430	440
Ca	BDL(a)	1040	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	7,000-500,000	13,700	0.92%
Cd	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	0.01-0.70	0.06	–
Co	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	1-40	8	6.7
Cr	6.2	9.3	BDL(a)	7.6	6.8	7.3	7.4	6.1	1-1,000	100	37
Cu	BDL(a)	10.9	7.9	8.7	5.2	10.8	9.2	15.9	2-100	30	17
Fe	26,500(b)	17,400(b)	9450(b)	10,500(b)	6560(b)	10300(b)	13,200	18,400(b)	7,000-550,000	38,000	1.8%
Hg	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	0.01-0.30	0.03	0.058
K	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	200-5,000	600	1.5%
Mg	BDL(a)	BDL(a)	324	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	600-6,000	5,000	0.44%
Mn	77(b)	152(b)	75.5(b)	86.8(b)	214(b)	242(a)	133	137(b)	20-3,000	600	330
Na	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	BDL(a)	750-7,500	6,300	0.59%
Ni	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(a)	BDL(c)	5-500	40	13
Pb	14.3	6.9	27.4	35	27.4	21.2	23.6	21.3	2-200	10	16
Sb	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	–	–	0.48
Se	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	0.43	BDL(a)	0.1-2	0.3	0.26
Tl	BDL(c)	BDL(a)	BDL(c)	BDL(c)	3.5	BDL(c)	BDL(c)	BDL(c)	–	–	–
V	42.8	25.2	18.4	19.8	14.2	20.7	27.6	30.7	20-500	100	58
Zn	25	124	12.6	16.8	20.1	31.8	34.4	67.3	10-300	50	48
Cyanide	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	BDL(c)	1	0.66	–	–	–

a Below Contract Required Detection Limits.
b Estimated Result.
c Below Instrument Detection Limit.

TABL ;

COMPARISON OF BACKGROUND CONCENTRATIONS (mg/kg) OF INORGANICS IN SOIL AT THE MEDLEY FARM SITE WITH COMMONLY OCCURRING RANGES

	BACKGROUND SOIL SAMPLES (Soil Boring SB1)			COMMON RANGE OF ELEMENTS IN SOIL - LINDSAY (1979)		
INORGANICS	SB1-S1 (5-7 ft.)	SB1-S3 (15-17 ft.)	SB1-S5 (25-27 ft.)	RANGE	SELECTED AVERAGE	ELEMENT CONC. IN SOILS - EASTERN U.S. - USGS (1984)
Ag	BDL (c)	BDL (c)	BDL (c)	0.01-5	0.05	-
Al	33,300	19,300	28,700	10,000-300,000	71,000	4.7%
As	17.6	14.2	21.4	1-50	5	5.2
Ba	BDL (a)	54.7	98	100-3,000	430	440
Be	BDL (a)	BDL (a)	1.3	0.1-40	6	0.63
Ca	BDL (a)	BDL (a)	BDL (a)	7,000-500,000	13,700	0.92%
Cd	BDL (a)	1.1	1.3	0.01-0.70	0.06	-
Co	BDL (a)	BDL (a)	13	1-40	8	6.7
Cr	10	5	BDL (a)	1-1,000	100	37
Cu	16 (b)	9.6 (b)	11.4 (b)	2-100	30	17
Fe	23,400	16,000	23,500	7,000-550,000	38,000	1.8%
Hg	BDL (c)	BDL (c)	BDL (c)	0.01-0.30	0.03	0.058
K	1,560	1,090	4,190	200-5,000	600	1.5%
Mg	1,480	1,870	5,610	600-6,000	5,000	0.44%
Mn	94.7	247	1,060	20-3,000	600	330
Na	BDL (c)	BDL (c)	BDL (c)	750-7,500	6,300	0.59%
Ni	BDL (a)	BDL (a)	BDL (a)	5-500	40	13
Pb	17.7	19.8	18.7	2-200	10	16
Sb	34.3	23.7	BDL (a)	-	-	0.48
Se	BDL (c)	BDL (c)	BDL (c)	0.1-2	0.3	0.26
Tl	BDL (c)	BDL (c)	BDL (c)	-	-	-
V	38.1(b)	23.2 (b)	23.4 (b)	20-500	100	58
Zn	23.6	25.4	65.4	10-300	50	48

a Below Contract Required Detection Limits.

b Estimated Result

c Below Instrument Detection Limit

2.4 FIELD PROCEDURES, DOCUMENTATION AND QA/QC REQUIREMENTS

All field and laboratory procedures including health and safety, equipment decontamination, and documentation of field activities will be in accordance with the approved P.O.P. for this project (Sirrine, January 1989). The type and number of quality assurance analyses will also be in accordance with that document. Additional procedures and requirements for proposed Phase II activities are presented in this Work Plan.

3.0 NEAR SURFACE SOIL SAMPLING

3.1 BACKGROUND SURFACE SOIL SAMPLING

If required to address Agency concerns, three near-surface composite soil samples will be collected from designated background areas at the Medley site. The purpose of these background samples is to document the range of soil metal concentrations occurring naturally in soils of the site.

The composite sample locations will be verified to be representative of natural, undisturbed soil conditions based on soil morphologic characteristics. These conditions will be verified by shallow hand auger boreholes and morphologic descriptions at each location prior to collection of analytical samples. Also, these sample points will be selected to be free from the influence of previous disposal activities at the site to the extent possible based on knowledge of site history and landscape position. The three background sample areas are depicted on Figure 3.1 as HA13 through HA15 representing three composite samples with three sub-samples each.

TABLE 2.6

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MEDLEY FARM SITE RI
COMPARISON OF INORGANICS CONCENTRATIONS (ug/L) IN GROUND WATER (SAPROLITE)

INORGANICS	SW1 (BACKGROUND)	SW3	SW4	EPA DRINKING WATER REGULATIONS MCLs (ug/L)
Ag	BDL (c)	20.2	BDL (c)	50 (d)
Al	189,000	11,800	41,400	–
As	65.6	BDL (c)	BDL (c)	50 (d)
Ba	1,690	BDL (b)	592	1,000 (d)
Be	14.2	BDL (b)	6	–
Ca	34,100	8,490	18,500	–
Cd	7	BDL (c)	BDL (c)	10 (d)
Co	183	BDL (b)	BDL (b)	–
Cr	97.8	12.7	20.8	50 (d)
Cu	307	45.2	BDL (c)	1,000 (e)
Fe	266,000	14,600	24.3	300 (e)
Hg	BDL (c)	BDL (c)	BDL (c)	2 (d)
K	105,000	6,180	9,100	–
Mg	143,000	6,150	24,300	–
Mn	10,700	794	3,210	50 (e)
Na	BDL (b)	9,930	12,600	–
Ni	116	BDL (c)	BDL (b)	–
Pb	45.8	5.3	24.3	50 (d)
Sb	492	BDL (c)	BDL (c)	–
Se	BDL (c)	BDL (c)	BDL (c)	10 (d)
Tl	BDL (b)	BDL (c)	BDL (c)	–
V	305	BDL (b)	72.3	–
Zn	1,290	19 (a)	884 (a)	5,000 (e)

a Estimated Result.
b Below Contract Required Detection Limit.
c Below Instrument Detection Limit.
d Primary Maximum Contaminant Level.
e Secondary MCL for Public Water Systems.

TABLE 2.7

MCDLEY FARM SITE RI
COMPARISON OF INORGANICS CONCENTRATIONS (ug/L) IN GROUND WATER (BEDROCK)

INORGANICS	BW1 (BACKGROUND)	BW2	BW4	EPA DRINKING WATER REGULATIONS MCLs (ug/L)
Ag	BDL (b)	BDL (c)	BDL (c)	50 (d)
Al	1,730	500	5,570	–
As	BDL (b)	BDL (c)	BDL (c)	50 (d)
Ba	BDL (b)	BDL (b)	BDL (b)	1,000 (d)
Be	BDL (c)	BDL (c)	BDL (c)	–
Ca	9,690	7,300	32,200	–
Cd	BDL (c)	10	BDL (c)	10 (d)
Co	BDL (b)	BDL (c)	BDL (b)	–
Cr	BDL (b)	BDL (c)	BDL (b)	50 (d)
Cu	BDL (b)	BDL (c)	BDL (c)	1,000 (e)
Fe	1,900	870	3,410	300 (e)
Hg	BDL (c)	BDL (c)	BDL (c)	2 (d)
K	BDL (b)	BDL (b)	BDL (c)	–
Mg	BDL (b)	BDL (b)	13,400	–
Mn	59.7	33	183	50 (e)
Na	10,700	8,400	12,900	–
Ni	BDL (c)	BDL (b)	BDL (c)	–
Pb	5.8	BDL (b)	BDL (c)	50 (d)
Sb	BDL (c)	BDL (c)	BDL (c)	–
Se	BDL (c)	BDL (c)	BDL (c)	10 (d)
Tl	BDL (c)	BDL (c)	BDL (c)	–
V	BDL (b)	BDL (c)	BDL (b)	–
Zn	BDL (b)	110	38.7 (a)	5,000 (e)

a Estimated Result
b Below Contract Required Detection Limit
c Below Instrument Detection Limit
d Primary Maximum Contaminant Level
e Secondary MCL for Public Water Systems

At each composite sample location the surface vegetation will be removed using a stainless steel spade/trowel, and the hole will be advanced to a depth of approximately 6 inches using a stainless steel hand auger. The sampling depth will be in the 6 to 24 inch depth zone depending on morphologic properties. This flexibility in sampling depth will enable the field scientist to sample the zone of maximum clay accumulation and thereby characterize the upper range of metals concentrations. Within each composite zone (HA13-HA15) three sub-samples will be collected. Auger cuttings from the sub-samples for each composite sample (HA 13 for example) will be composited into a stainless steel bowl and mixed with a stainless steel utensil. A sample will then be collected and carefully placed in glass containers and labeled according to location, depth and analysis in accordance with the Project Operations Plan (Section 5.7). Likewise, decontamination procedures set forth in the POP will be employed in this sampling program.

3.2 SURFACE SOIL SAMPLING IN THE FORMER DISPOSAL AREA

Twelve surface soil samples will be collected in the area of the former disposal area and around its perimeter. The purpose of these samples is to document the levels of organic contaminants present in surficial soils for input to the risk assessment model. Thus, this sampling program is designed to characterize contaminant levels in the zone most likely to be ingested by humans. These samples will be collected from the 0 - 12 inch zone and will be analyzed for TCL - volatiles and semi-volatiles only.

The sample locations have been tentatively selected at points throughout the disposal area and its perimeter, and are identified in Figure 3.1 as sample points HA1 through HA12. At each sample location, the surface vegetation will be removed using stainless steel implements. Representative soil samples will then be collected in the 0 - 12 inch zone using a stainless steel hand auger. Samples will be containerized and labeled according to methods established in the POP.

4.0 GROUND-WATER SAMPLING AND HYDRAULIC EVALUATIONS

4.1 OVERVIEW

A dynamic program of ground-water sampling utilizing the Hydropunch™, pneumatic packers and bladder pumps, and permanent well installations will be implemented to provide further characterization of the distribution of volatile organic compounds in ground water at the site. Water level measurements taken in monitoring wells, temporary piezometers, and at surface water gaging stations will be used to define the ground-water flow system. Evaluation of potentiometric levels at saprolite and bedrock well pairs will enable further evaluation of the inter-relationship of ground-water flow in these units.

Proposed and existing ground-water sampling locations, temporary piezometers and staff gaging stations are shown on Figure 4.1. The types of installations and ground-water sampling methods are discussed in Sections 4.2 and 4.3. The rationale for the selection of sampling/measurement locations are discussed in Section 4.4. All new well installations will be made in accordance with specifications presented in the approved POP.

4.2 SAPROLITE AQUIFER

A stainless steel Hydropunch™ will be used to collect ground-water samples from the saprolite aquifer at four locations as shown on Figure 4.1. All boreholes drilled for Hydropunch sampling will be made using hollow stem augers, decontaminated in accordance with the approved POP. The Hydropunch will be decontaminated in the field prior to collecting each sample according to the sampling equipment decontamination procedures described in Section 5.1.6.4 of the POP. The sampler will be driven or pressed into the saprolite at each sampling location at a depth of approximately ten feet below the static water level. After allowing approximately 30 minutes for ground water to enter the sampler, the Hydropunch™ will be retrieved, and the stopcock will be opened to allow the

sample to be drained directly into the VOA vial. All ground-water samples collected with the Hydropunch™ will be analyzed for TCL volatile organic compounds on a rush basis (24 to 48 hour turnaround) using routine laboratory QA/QC. The results of analyses of ground-water samples collected with the Hydropunch™ will be used to determine locations for new monitoring well installations as indicated on Figure 4.1. Up to six new saprolite monitoring wells will be installed during this program.

At each hydropunch sampling location, a section of slotted PVC pipe will be left standing in the completed borehole for approximately 24 to 48 hours so that stabilized water level measurements can be made at these locations. Each borehole will then be abandoned with grout as described in the POP.

4.3 BEDROCK AQUIFER

Three to seven additional bedrock wells will be installed at the approximate locations shown on Figure 4.1. Approximately 20 feet of bedrock will be cored at each location and wells will be completed in accordance with procedures described in the POP.

At one of the new bedrock well locations shown on Figure 4.1 (BW 105), the well casing will be extended through the fractured transition zone commonly encountered at the top of the bedrock aquifer, and approximately ten feet into competent bedrock. The bedrock will then be cored to a depth of 50 feet below the casing. After development, a stainless steel and teflon bladder pump will be isolated using a pneumatic packer assembly to sample ground-water from discrete fracture zones identified in the bedrock core hole. Sampling zones will be identified in the field by an experienced hydrogeologist based upon inspection of the bedrock core. Samples collected from discrete fracture zones will be analyzed for TCL volatile organic compounds to evaluate the vertical distribution of contaminants in the bedrock aquifer. These analyses will be performed on a rapid turnaround basis using routine laboratory QA/QC. A duplicate set of samples will be collected from

each zone and will be shipped to the CLP laboratory and held for potential CLP analyses. Samples will be subjected to CLP analyses based upon review of non-CLP analytical results to confirm "clean" ground-water. Non-CLP analyses will also be reviewed prior to completion of field activities and a corresponding length of corehole will be abandoned by tremie grouting using cement/bentonite grout if a significant decrease in residual chemical concentrations is present.

4.4 RATIONALE FOR PROPOSED GROUND-WATER SAMPLING LOCATIONS

Proposed monitoring well and Hydropunch™ sampling locations are presented on Figure 4.1. The results of Hydropunch sampling and analyses will be used to determine the final placement of monitoring wells at several locations; HP101, HP102, HP103, and HP104. If ground water is not encountered in the saprolite at any of these locations, a bedrock well will be installed at the primary location or alternate location as indicated on Figure 4.1.

A saprolite/bedrock well pair will be installed at the SW106/BW106 location, regardless of the results of Hydropunch sampling. This location will provide screening for the potential migration of residual chemicals along fractures which may be associated with the pronounced ravines which intersect at this point. A set of ground-water samples will be collected from these wells approximately 48 hours after development. These samples will be analyzed for TCL volatile organics on a rapid turnaround basis using routine laboratory QA/QC. Based upon evaluation of these results, the need for an additional well pair at SW107/BW107 will be evaluated as indicated on Figure 4.1.

The overall distribution of monitoring wells, temporary piezometers, hydropunch borings and staff gaging stations will provide sufficient data to determine ground-water flow patterns and discharge areas at the site. Based upon the low levels of contaminants detected at SW3 during Phase I, and extremely difficult access considerations, no monitoring wells or piezometers are proposed northeast of the former disposal area (northeast of SW3). Water

level elevations will be determined at proposed staff gage stations (SL3 and SL4) which will be located at the bottom of the ravine in the tributary to Jones Creek as shown on Figure 4.1. Field observations indicate that this tributary represents base flow during dry seasons from the site. This information will be incorporated into our evaluation of ground-water flow patterns from the site. It is also important to note that no volatile or semi-volatile organic compounds were detected above SQLs in analyses of surface water or stream sediment samples (RW-2/SS-2) collected form this tributary to Jones Creek during Phase I of the RI.

The rationale for the selection of each of these locations is presented briefly below:

- HP101/SW101/BW101; This location appears to be hydraulically downgradient of BW2 and is between bedrock wells BW2 and BW3. Phase I data indicates that the predominant ground water flow direction in both the saprolite and upper portion of the bedrock is toward the east. No contaminants were detected in Phase I analyses at BW3 although 1.795 mg/l (Phase IA) and 1.418 mg/l (Phase IB) of total volatile organics were detected in samples analyzed from BW2. Ground-water was not present in the saprolite at the BW2 location. The hydropunch will be used at this location to site a well pair near the leading edge of contaminants in the saprolite aquifer in this area.

- HP102/SW102/BW102; This location will provide characterization of contaminant concentrations halfway between BW2 and BW4 at a distance out from former disposal areas believed to be close to the leading edge of contaminants migration, based on Phase I modeling efforts.

- HP103/SW103/BW103; This location will enable evaluation of the potential southerly component of ground-water flow from the former disposal area and will provide characterization of contaminants which may have migrated directly south from the former disposal site.

- HP104/SW104/BW104; These locations will provide evaluation of any potential southwesterly component of ground-water flow or contaminant migration from the former disposal area.

- BW105; A deeper bedrock well will be drilled and sampled at this location to evaluate the potential vertical migration of contaminants. This location was selected adjacent to SW4 where the highest levels of volatile organic compounds detected in ground-water were found during the Phase I RI.

- SW106/BW106; A saprolite/bedrock well pair will be installed at this location to evaluate the potential migration of contaminants in ground water along the prominent ravines which intersect here and may represent fracture systems in the subsurface. This will also provide valuable ground-water level data to evaluate southerly flow components from the site.

- SW107/BW107; A pair of wells may be installed here if preliminary analytical data indicate that contaminants are present at SW106/BW106.

4.5 CONFIRMATION OF BACKGROUND CONDITIONS

In addition to the Hydropunch borings and new saprolite and bedrock monitoring well locations described above, a temporary piezometer (PZ101) will be installed in the saprolite aquifer west of the Ralph Medley household at the approximate location shown on Figure 4.1. This piezometer will be constructed entirely of PVC materials and will be used exclusively for the measurement of water levels. All other construction details will be the same as monitoring well installations. Water level measurements from this piezometer will be used to confirm that the Sprouse domestic well (location included on figure 4.1) is located upgradient of the Medley Farm Site, and therefore is not impacted by contaminants from the Site.

Based upon SCDHEC correspondence dated July 11, 1983 (RE: Medley Drum Site, Cherokee County, by Workman, S.M. and Sofge, G.), the Sprouse well is a 24 inch diameter bored well. As indicated in that document, large diameter bored wells in the S.C. piedmont typically extend to depths of 10 to 30 feet below the water table. This well would therefore draw from the saprolite and potentially the upper portion of the bedrock aquifers. Background wells SW1 and BW1, installed and sampled during the RI, are screened in these zones. Phase I data indicates that these wells are upgradient of the former Medley disposal site, and between the site and the Sprouse well. Phase I RI analyses, in our opinion, indicate that these wells have not been impacted by contaminants from the site.

The proposed piezometer will address concerns raised in the Agency's comments as to whether the Sprouse well and background wells SW1 and BW1 are in fact upgradient of the Medley Farm Site and that water quality in these wells is not impacted by former disposal activities at the Site.

4.6 WATER LEVEL MEASUREMENT

Water levels will be measured in all wells installed at the site on a weekly basis during the course of the Phase II field work. Measurements of surface water elevations will also be made at the same time at four staff gage locations as shown on Figure 4.1. Surveyed reference elevations will be obtained at each location. This information will be used to evaluate ground-water flow patterns, discharge areas, and head relationships between the bedrock and saprolite aquifer at the Site.

4.7 HYDRAULIC TESTING

Slug tests will be performed in each of the new completed saprolite wells to provide additional data on the hydraulic conductivity of the saprolite. Water pressure tests will be

conducted in open-hole sections of bedrock wells to measure rock mass permeabilities at those locations.

All hydraulic testing will be performed in accordance with the approved POP.

This information will be used to support ground-water modeling and the evaluation of contaminant migration rates for the risk assessment and to support aquifer remediation feasibility evaluations.

5.0 PHYSICAL SOILS ANALYSES

Grain size analyses, atterberg limit determinations, and natural moisture content evaluations will be performed on representative soil samples selected by Sirrine to support geologic field descriptions of soils encountered in boreholes drilled for monitoring well installations. This data will provide quantitative characterization of subsurface conditions. At a minimum, one representative sample of the saprolite aquifer medium will be subjected to grain size analyses from each new saprolite well location.

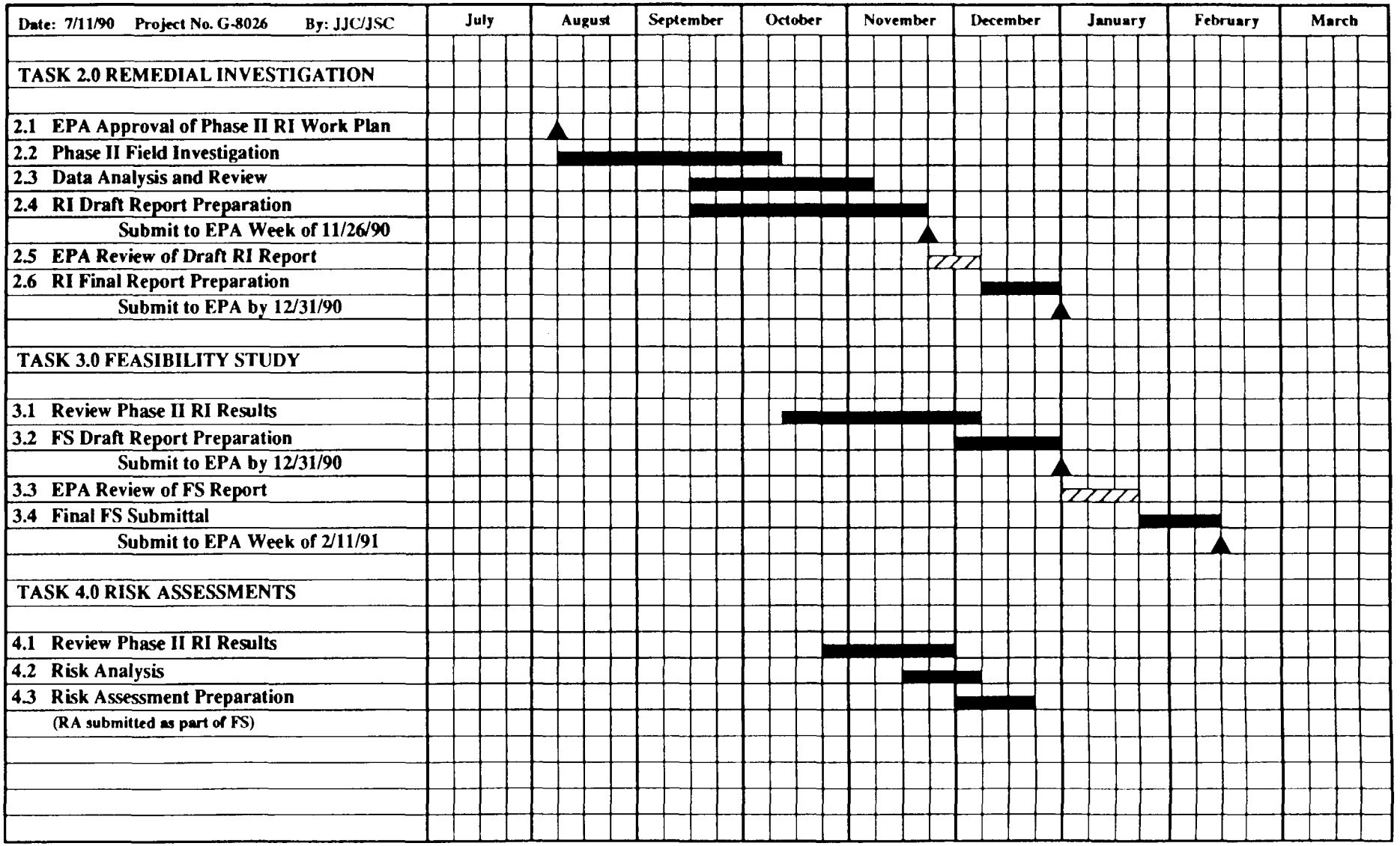
This information will be used in combination with similar Phase I data for correlation of soil characteristics across the site and to provide a basis for estimation of soil porosity or other parameters which must be selected from empirical values. This will support the modeling of ground water flow and contaminant migration and evaluations of soil vapor and ground-water extraction.

6.0 PROPOSED SCHEDULE FOR COMPLETION OF THE RI/FS

Figure 6.1 presents the proposed schedule for implementation of this Work Plan and completion of the Medley Farm Site RI/FS. Based upon the Agency's concerns, an aggressive schedule has been established. Completion of this work within the proposed schedule is contingent upon drilling subcontractor availability and performance, favorable weather for completion of field activities (minimal rain), acceptable laboratory performance and subsurface conditions consistent with those encountered during Phase I of the RI. It is also imperative that EPA review is accomplished within the allocated time frames to meet this schedule.

SIRRINE
ENVIRONMENTAL
CONSULTANTS

SCHEDULE FOR: Medley Farm Site Remedial Investigation/Feasibility Study



7.0 REFERENCES

Environmental Protection Agency., February 1, 1988. Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses.

Environmental Protection Agency., July 1, 1988. Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses.

Sirrine Environmental Consultants, Inc., August, 1988. Medley Farm Site Remedial Investigation/Feasibility Study Work-Plan.

Sirrine Environmental Consultants, Inc., January, 1988. Medley Farm Site Remedial Investigation/Feasibility Study - Project Operations Plan.

Attachment A

EPA Region IV Comments on Draft Phase II RI/FS Work Plan for the Medley Farm Superfund Site

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

AUG 1 0 1990

4WD-NSRB

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Mr. Mary Jane Norville
King & Spalding
2500 Trust Company Tower
Atlanta, GA 30303

Re: Comments on Draft Phase II RI/FS Work Plan
for the Medley Farms Superfund Site

Dear Ms. Norville:

Copies of the above referenced document were received on July 11 and 12, 1990 for review. Copies of this document were disseminated to various programs within EPA, the South Carolina Department of Health and Environmental Control (SCDHEC), and Versar, EPA's oversight contractor. Below are the comments generated as a result of this review. As of this date, the Agency has not received any comments from SCDHEC. Upon receipt of comments from SCDHEC, I will forward them to the PRPs.

To insure that there is no misunderstanding as to the Agency's expectation from this Phase II effort, it is our understanding that Phase II will include all work to select a remedial alternative. In your letter of July 11, 1990, you stated "Proceeding with additional work now will in no way impact the overall schedule for remediation of the Site." The Agency interprets this to mean that any treatability studies that need to be done will be done as part of the RI/FS process and not part of the Remedial Design (RD) process. In other words, the RD activities will consist only of designing the selected remedy. This approach, conducting treatability studies as part of the RI/FS phase instead of the RD/RA phase, is consistent with EPA's RI/FS guidance.

1. Page 1, Section 1.0 INTRODUCTION: Include in this section language that expresses the idea that Phase II work will also provide the necessary data to design the selected remedy (i.e., there will be no need for treatability studies as part of the RD phase).

2. Page 4, last line in last bullet: "Phase IV" should read "Phase IB".

3. Page 8, Section 1.4 PHASE II RI OBJECTIVES: Any and all anticipated treatability studies need to be included as part of Phase II objectives.

4. Page 8, Section 1.4 PHASE II RI OBJECTIVES, first paragraph, fourth line down: Typo.

5. Page 8, Section 1.4 PHASE II RI OBJECTIVES, second paragraph: Typo.

6. Page 9, Section 1.4 PHASE II RI OBJECTIVES: Inform EPA with specific completion date for Phase II field work so that the schedule in this work plan can be revised accordingly. Although this may not be an objective in the traditional sense, it is important to the Agency that Phase II is completed as quickly as possible and that the resulting documents, the Remedial Investigation report, the Risk Assessment, and the Feasibility Study, be submitted on schedule.

7. Page 10, Section 2.1 DATA QUALITY OBJECTIVES: This section discusses the use of Level III and IV data quality, but not Level II. This in itself means that no field screening (i.e., use of HNu, OVA, etc.) will be conducted during Phase II field work. If this is not the case, then the level of data quality needs to be discussed in this section.

8. Page 10, Section 2.2 SUMMARY OF PROPOSED FIELD ACTIVITIES AND CHEMICAL ANALYSES, third sentence: It is questionable if the Hydropunch™ will be able to collect groundwater samples from discrete intervals in the fractured bedrock. This sentence needs to be clarified.

9. Page 11, Table 2.1, first bullet: The term "near surface soil samples" is confusing. If we are talking about surface soil samples (i.e., 0-12 inches in depth), then use the term "surface soils samples".

10. Page 11, Table 2.1: Include Treatability Studies if appropriate.

11. Page 12, Table 2.2: Refer to comment number 9.

12. Page 12, Table 2.2: Please be advised that EPA will split, at a minimum, one surface soil sample and two groundwater samples as part of Phase II oversight activities.

13. Page 12, Table 2.2: It is noted in this table that inorganic groundwater samples will be filtered. EPA does not recognize filtered groundwater samples. At some NPL sites the PRPs have elected to collect and analyze both filtered and unfiltered samples for the purpose of comparison.

14. Page 12, Table 2.2: If field screening methods are to be used during field activities, these methods should be identified in Table 2.2 as well as in Section 2.1. Refer to comment number 7.

15. Page 13, Section 2.3.1 Soils Analyses, first paragraph, first line: Refer to comment number 9.

16. Page 13, Section 2.3.1 Soils Analyses, second paragraph: The phrase "significant levels" needs to be better defined. What is meant by "significant levels", above mandatory clean up levels?

17. Page 15, Section 2.3.2 Ground Water Analyses, first paragraph, first sentence: Please refer to comment 47 from EPA's comments on the draft RI report. This comment read "Page 80, Table 5.7: The groundwater results of several inorganics were left out of this table for SW1 (the reportedly background well. They are As, Cd, Co, Cu, Sb, and Vn. The detected arsenic (65.6 ug/l and chromium (97.8 ug/l) levels exceed the current MCL for drinking water (both 50 ug/l).". This sentence needs to be revised.

18. Page 15, Section 2.3.2 Ground Water Analyses, first paragraph, sixth line down: Data from filtered groundwater samples will not be accepted. Filtered samples can be collected if Sirrine wants to do an internal comparison, but only data from unfiltered samples will be accepted. Refer to comment number 13.

19. Pages 17 and 18, Tables 2.4 and 2.5: It is more appropriate to include the data from soil boring SB1 (background) in Table 2.4 than in Table 2.5. The Agency predominately compares site related data to site related background data (i.e., soil boring SB1).

20. Page 19, Section 2.4 FIELD PROCEDURES, DOCUMENTATION AND QA/QC REQUIREMENTS: The exact decontamination procedures to be used should be restated here. The POP (January 1989) was never changed to reflect the use of organic-free water after the solvent rinse. If no organic-free water is available, the equipment should be allowed to air dry as long as possible. Also, steam cleaning only for drilling equipment and well materials is not as acceptable practice for decontamination. This was pointed out several times in comments made on the POP.

21. Page 19, Section 2.4 FIELD PROCEDURES, DOCUMENTATION AND QA/QC REQUIREMENTS: The Phase II RI/FS Work Plan needs to include a statement that states activities will be in accordance with EPA, Region IV Standard Operating Procedures, or approved modifications to these procedures.

22. Page 20, Table 2.6: The concentration levels for arsenic, barium, and chromium in the background monitor well, SW1, are above the Maximum Concentration Limits (MCLs). It is understood that no inorganic (metals) contamination has been detected in the source areas (disposal areas), and additional field work is proposed upgradient of the disposal area, but no mention is made relative to sampling the Sprouse well which is also upgradient. Although the Sprouse well is considered upgradient of the contaminant plume, the detections in the background monitor well warrants sampling of the Sprouse well. The Sprouse well should be sampled and analyzed for volatile organic compounds (VOCs) and metals.

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23. Page 20, Table 2.6: Strong consideration should be given to resampling the background well SW-1 as the levels of metals listed on this table are much than what would be expected for background levels.

24. Page 23, Section 3.2 SURFACE SOIL SAMPLING IN THE FORMER DISPOSAL AREA: All proposed surface soil sampling locations are over 100 feet apart. A grid system, based on 100 foot nodes, may be more appropriate. Additional surface soil sampling locations are necessary to adequately characterize the former waste disposal area surface soils. This additional surface soil data will better support the Risk Assessment.

25. Page 23, Section 3.2, SURFACE SOIL SAMPLING IN THE FORMER DISPOSAL AREA, first paragraph, last sentence: Analyses will need to include TAL until such time that the Agency concurs that metals are not a site related contaminant.

26. Page 24, Section 4.0 GROUND-WATER SAMPLING AND HYDRAULIC EVALUATIONS: A bedrock well should be installed be installed near SW-3 and a shallow well should probably be installed approximately halfway between SW-3 and SW-4. The bedrock well proposed near SW-4 appears appropriate.

27. Page 24, Section 4.0 GROUND-WATER SAMPLING AND HYDRAULIC EVALUATIONS: This section does not clearly state what type of drilling method will be used to install the permanent monitor wells.

28. Page 24, Section 4.2 SAPROLITE AQUIFER: Should the Hydropunch™ method fail to meet the objectives of this Work Plan, what alternative is available to provide the necessary data to help locate the monitor wells?

28. Page 24, Section 4.2 SAPROLITE AQUIFER, second sentence: This sentence is confusing. Why is the use of hollow stem augers necessary with the Hydropunch™? This point needs to be clarified.

29. Page 25, 4.2 SAPROLITE AQUIFER, first paragraph: Is it feasible to leave the slotted PVC pipe in the Hydropunch™ boreholes until such time that all water level readings can be taken, across the site, in a short time frame? If groundwater levels are collected over a period of time, there will undoubtedly be some question as to the usefulness on this groundwater level data.

30. Page 25, 4.2 SAPROLITE AQUIFER, first paragraph: The statement is made that PVC casing will be left standing in the borehole at each Hydropunch™ location, and after water level measurements are made the hole will be abandoned with grout. Consideration should be given to coverting these boreings to permanent piezometers. Very little additional expense and effort will be necessary to convert the borings to piezometers, and considering the complex hydraulics of Piedmont aquifers the site should have as many aquifer water level monitoring locations as possible.

31. Page 25, 4.3 BEDROCK AQUIFER, second paragraph: Why terminate the coring at a depth of 50 feet? Why not core to a depth of 100 feet below the bottom of the well casing? A defensible rationale needs to be incorporated into this paragraph with respect to the depth of the installation of monitor well BW 105.

32. Page 25, 4.3 BEDROCK AQUIFER: What is the rationale for not using geophysical logging techniques in assisting the delineation of discrete facture zones in the bedrock. Geophysical logging would be especially helpful if core recovery is poor.

33. Page 27, 4.3 BEDROCK AQUIFER, top of page: It is stated "...shipped to the CLP laboratory and held for potential CLP analyses." Sample holding times must be considered.

34. Page 27, 4.3 BEDROCK AQUIFER, top of page: A working, useable definition of the phrase "significant decrease in residual chemical concentrations" must be provided.

35. Page 27, 4.4 RATIONALE FOR PROPOSED GROUND-WATER SAMPLING LOCATIONS, first paragraph, last sentence: The criteria that this decision (i.e., install the bedrock well at the primary location or alternate location) needs to be identified.

36. Page 27, 4.4 RATIONALE FOR PROPOSED GROUND-WATER SAMPLING LOCATIONS, last paragraph: It is stated that no monitor wells are proposed northwest of monitor well SW3 due to low contaminant concentrations detected in well SW3, and extremely difficult access for locating a new well. It is important to install a monitor well north of SW3 because groundwater samples from SW3 had concentrations of several contaminants that exceeded MCLs. The following table lists the concentration of contaminants that exceeded MCLs in Phase I.:

COMPOUND	CONCENTRATION (ug/l)	MCL (ug/l)
1,1-Dichloroethene	8.0	7.0
1,2-Dichloroethene	9.0	5.0
Trichloroethene	140.0	5.0
Tetrachloroethene	190.0	5.0 (pMCL)

(Note: The data reported in this table is from Phase IA sampling; trichloroethene and tetrachloroethene exceeded MCLs in Phase IB sampling.)

Monitor well SW3 is the northeastern-most well on this side of the site, therefore, the northeastern extent of the plume has not been delineated.

37. Page 28, 4.4 RATIONALE FOR PROPOSED GROUND-WATER SAMPLING LOCATIONS, top of page: If the assumption is that groundwater is discharging to this tributary, why not collect surface water/sediment samples at locations SL3 and SL4? The water flowing in this stream is slow. Therefore, it is quite conceivable that if contaminants (i.e., volatiles) are entering this surface stream in this vicinity, which is closest

surface water to the site, that these volatiles are more likely than not volatilizing out of the water column prior to reaching the the previous surface water sampling point, RW-2. These samples should at a minimum be analyzed for volatile compounds.

38. Page 28, 4.4 RATIONALE FOR PROPOSED GROUND-WATER SAMPLING LOCATIONS, last bullet and Figure 4.1: There are three (3) statements associated with location HP 103 on Figure 4.1. They are:

    If VOC's detected, no wells
    If no saturated saprolite, install bedrock well
    If VOC's not detected [move well location closer to disposal area as indicated by arrow].

    What is the rationale for no wells for the first bullet? If contaminants are detected, then what is being proposed? Delete monitor wells SW103/BW103 and rely on monitor wells SW106/BW106 to define the extent of the plume?

39. Page 29 and Figure 4.1: Rationale is provided that the proposed well group 104 (southwest of existing monitor well SW4) will help evaluate the southwestward movement of groundwater and groundwater contamination. However, on Figure 4.1 the scenario states that if no contamination is detected in the Hydropunch™ location HP104, then no permanent monitor wells will be installed in this area. Permanent monitor wells should be installed at locations west and southwest of SW4 for the same reasons described above for SW3; concentrations of 1,1-Dichloroethene, 1,1-Dichloroethane, and 1,1,1-Trichloroethane exceed MCLs in groundwater from SW4, and it is the well on the northwestern-most side of the plume. As a result, the northwestern extent of the plume has not been delineated, and both saprolite and bedrock monitor wells are necessary.

40. Page 29 and Figure 4.1: The proposed monitor well pair SW107/BW107 should be moved approximately 200 feet northwestward, up the ravine, to be located near the intersection with the northeast/southwest trending ravines. This rationale is consistant with the rationale for the location of well pair 106; placement of wells at intersections of ravines because the ravines possibly represent fracture systems in the underlying bedrock which act as preferred flow routes for groundwater and contaminant migration.

    After completion of Phase II site investigation, groundwater clean up levels will be established for the contaminants detected in the aquifer beneath the site. The aquifer is a current source of drinking water, therefore, it is classified as a Class IIA aquifer under the EPA Ground-Water Protection strategy. As a Class IIA aquifer, the remediation standards will be MCLs, Proposed MCLs (pMCLs), MCL goals (MCLGs), and/or criteria based upon protection of human health via ingestion of drinking water as approved by an EPA toxicologist.

41. Page 27, Section 4.4: What is the rationale for not sampling the Sprouse well? Refer to comment number 22.

42. Page 30, top of the page: Refer to comment number 22.

The comments above need to addressed to the satisfaction of the Agency in order for the Agency to approve the Phase II RI/FS Work Plan. As can be gleaned from the above comments, there are several issues that may need to be discussed in length. The first being extending the groundwater investigating in a northeastwardly direction. Another issue is the type of analyses to be ran on the surface soil samples. If the PRPs and SEC would like to meet with the Agency to discuss these comments, the meeting should occur a week following the receipt of these comments.

If you have any questions, please contact me at 347-7791.

Sincerely yours,

Jon K Bornholm

Jon K. Bornholm
Remedial Project Manager

cc: Jim Chamness, Sirrine
Bernie Hayes, EPA
Keith Lindler, SCDHEC
David Schaer, Versar
Jonathan Vail, EPA

Attachment B

Medley Farm Site Steering Committee Response to EPA Comments

KING & SPALDING
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TELECOPIER: 202 737-5714

3 4 0245

August 27, 1990

BY HAND DELIVERY

Mr. Jon K. Bornholm
Remedial Project Manager
United States Environmental
Protection Agency, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Re: Medley Farm Site - Phase II Remedial Investigation

Dear Mr. Bornholm:

I am writing on behalf of the Medley Farm Site Steering Committee. The Steering Committee's response to EPA's comments on the Work Plan for the Phase II Remedial Investigation at the Medley Farm Site is attached. This response was prepared by the Steering Committee's consultant, Sirrine Environmental Consultants. We have indicated at appropriate points in the response where decisions to address the comments were made and agreed to by you, on behalf of EPA, in conference calls on August 8, 1990 and August 10, 1990. This letter will also confirm the decisions agreed upon during those conferences. As you know, we just received on Friday, August 24, 1990 the comments from the South Carolina Department of Health and Environmental Control ("SCDHEC") on the Work Plan. I appreciate your telecopying them to me. We will respond to those comments as soon as possible.

As we discussed and agreed upon in our telephone conference on August 8, 1990, the soil sampling took place on August 9, 1990. In accordance with our discussions, the sampling locations were as outlined in the Work Plan. You agreed with Sirrine's response to comment number 24 that the sampling locations were based on a 100-foot grid sufficient to provide representative samples of the overall Site conditions. In addition, the Steering Committee informed you during the August 8, 1990 conference that it would, in response to comment 25, analyze three of the surface soil samples taken from the former disposal areas for TAL metals.

In our conference call with you and your consultants, Versar, on August 10, 1990, we discussed and agreed upon responses to

comments regarding use of the Hydropunch and locations of the saprolite and bedrock wells. You indicated that you believed EPA Region IV would accept analysis of samples taken using the Hydropunch method as valid data for determining levels of contaminants at a particular location. If the agency would not accept such analysis, the Steering Committee explained they would need to consider an alternate method of determining where certain wells should be placed. You agreed to notify us as soon as possible if that proved to be the case. Otherwise, after further explanation of the Hydropunch method, you and the Versar staff agreed that the proposed use of the Hydropunch as outlined in the Work Plan was appropriate. The Steering Committee informed you that in response to your comments numbered 29 and 30, it would install PVC piezometers simply for the purpose of measuring levels of groundwater in the Hydropunch boreholes following sampling with the Hydropunch.

In response to your comment number 31, Jim Chamness, with Sirrine, explained the rationale for limiting the depth of the bedrock well BW105 to 50 feet. You and the Versar representatives agreed with the explanation that coring to this depth would minimize the potential for creating a pathway for vertical migration of contaminants into portions of the bedrock aquifer not otherwise impacted. You also agreed that the necessity for drilling deeper, or for alternative measures to determine the vertical extent of contamination, could be assessed following the initial drilling.

We also discussed, in response to your comment number 36, the need for additional wells in the vicinity of the existing well SW3. We all agreed that an additional bedrock well would be installed adjacent to SW3, or at a location northwest of SW3, depending on accessibility. In addition, we agreed to install a saprolite well at the location of the proposed stream gauging stations SL3 and SL4. This well may have to be installed using hand tools due to difficulties in accessing that location. You also agreed that these additional wells would eliminate the need for the proposed surface water/sediment samples proposed in your comment number 37. The Steering Committee informed you that it agreed with comment number 40 and would, therefore, change the placement of well pair SW107/BW107.

In the August 10, 1990, conference call, we also discussed the proposals in the Work Plan to confirm that metals are not contaminants of concern at the Site. We explained that we would take both filtered and unfiltered samples from the existing background well, and would further develop the background well to better assess the background levels of metals at the Site. Analyzing soil samples for TAL metals, as discussed above, will

also contribute to this effort. You agreed that these actions were responsive to comments 17 and 18.

We also discussed the Work Plan proposals to confirm that the Sprouse well has not been impacted by the Site. We discussed the use of the piezometer to provide additional data regarding groundwater flow northwest of the Site. We explained our concerns about sampling the Sprouse well and offered to measure the depth of the Sprouse well to add additional information for finally determining whether the well has been impacted by the Site. The piezometer will also be installed early in the Phase II Remedial Investigation so that we can determine whether additional investigation is necessary to confirm that the Sprouse well has not been impacted. You agreed with this approach. If water levels obtained from the piezometer do not confirm that the Sprouse well is upgradient, we will contact you to discuss the need for further investigation.

The responses discussed in our conference calls on August 8 and August 10 are reiterated and discussed further in the attached response to EPA's comments. This letter is simply to confirm the agreements reached in the conference calls. As we discussed during those conferences, the field work is proceeding according to the schedule outlined in the Work Plan. As noted above, the soil sampling took place on August 9, 1990. In addition, drill rigs were mobilized on the Site the week of August 13, 1990 and work was begun on redeveloping the background well.

The Steering Committee and Sirrine will provide you with frequent reports on the progress of the field work. We understand the need to assure that the schedule outlined in the Work Plan is met.

If you have any questions regarding our response to EPA's comments, please contact me at 572-3585.

Sincerely,

Mary Jane Norville/asm

Mary Jane Norville

MJN/da
Enclosure
39004.44003

cc: Mr. Keith Lindler, SCDHEC
Mr. Gary Stewart, SCDHEC
Mr. Jim Chamness, Sirrine
Medley Farm Site Steering Committee

RESPONSE TO EPA COMMENTS (DATED AUGUST 3, 1990)
ON THE:
PHASE II RI/FS WORK PLAN FOR THE
MEDLEY FARM SUPERFUND SITE

3 4 0248

August 13, 1990

Prepared By: Sirrine Environmental Consultants, Inc.
Post Office Box 24000
Greenville, South Carolina 29616

The following responses to the Agency's comments provide clarification of the proposed Phase II RI/FS activities for this site. Upon Agency approval, this document will supplement the Phase II RI/FS Work Plan (dated July 11, 1990) and the approved Project Operations Plan (dated January 1989) which describes in detail the activities and procedural protocols for this work.

EPA COMMENT	WORK PLAN REFERENCE	RESPONSE
1	Page 1, 1.0	Based upon our evaluations of all data gathered to date, treatability studies will not be necessary for the design of anticipated remedies for this site.
2	Page 4, last line	Phase IV should read Phase IB.
3	Page 8, 1.4	See response to Comment #1.
4 and 5	Page 8, 1.4, Typo's	Acknowledged
6	Page 9, 1.4	Phase II, RI field investigations will be completed by October 12, 1990. The time frame for "Field Investigations" includes turn around time for laboratory analyses. The Steering Committee will advise EPA if these activities are completed sooner than anticipated.
7	Page 10, 2.1	Field screening will not be used for the selection of samples during Phase II RI activities. Field screening will be utilized for Health and Safety purposes and general information only.

5 4 0249

8	Page 10, 2.2	A Teflon and stainless steel bladder pump mounted between pneumatic packers will be used to collect ground-water samples from discreet intervals in the fractured bedrock aquifer.
9	Page 11, Table 2.1	"Surface" soil samples will be collected from the depth intervals as indicated in the first bullet on this Table: 0 to 24 inches.
10	Page 11, Table 2.1	See response to Comment #1.
11	Page 12, Table 2.2	See response to Comment #9
12	Page 12, Table 2.2	Sirrine will advise the Superfund Project Manager or the on-site EPA Oversight representative of Field work schedules to facilitate the collection of EPA split samples by the Oversight contractor.
13	Page 12, Table 2.2	Both filtered and unfiltered samples will be collected from the background wells (SWI and BWI) and analyzed for TAL inorganics.
14	Page 12, Table 2.2	See response to Comment #7.
15	Page 13, 2.3.1	Twelve surface soil samples will be collected and analyzed for ...
16	Page 13, 2.3.1	As discussed in the draft RI Report prepared on the basis of Phase I site investigations, levels of inorganics, PCB,s and pesticides detected in soil samples analyzed from the site are consistent with

		background levels and agricultural land use. "Significant levels" as used in the test at page 13, 2.3.1, are defined as levels above background or established action levels.
17	Page 15, 2.3.2	The revised tables were submitted to EPA on June 29, 1990 and will be included in the revised RI Report. The absence of VOC's and SVOC's in background wells SW-1 and BW-1 indicate no impact to groundwater from former disposal activities at this location. The Phase I RI soils and groundwater analysis indicated that concentrations of inorganics at the site are consistent with local background levels. Additional sampling and analysis is included in the Phase II RI to provide further substantiation of this. A review of field sampling logs indicates that slightly elevated levels of inorganics noted in the analysis of groundwater samples form SWI are due to sample turbidity. This well will be re-developed prior to Phase II sampling to alleviate this problem. This approach was discussed and agreed upon in our conference call of August 9, 1990.
18	Page 15, 2.3.2	Both filtered and unfiltered samples will be collected and analyzed for TAL metals from monitoring well SW-1 during the Phase II RI.
19	Pages 17 and 18 Tables 2.4 and 2.5	These tables were designed to be used together.

20	Page 19, 2.4	Equipment decontamination procedures included in the P.O.P. dated January, 1989 were approved for this project. A copy of correspondence sent from the agency to King & Spalding dated 16 May, 1989 confirming this is attached.
21	Page 19, Table 2.4	All Phase II RI/FS field work will be performed in accordance with EPA, Region IV Standard Operating Procedures and modifications approved by the EPA RPM as described in the P.O.P. and associated correspondence for this project. See response to Comment #20. This was discussed and agreed upon during our conference call on August 9, 1990.
22	Page 20, Table 2.6	See response to Comment #17. Since the Sprouse well may have been impacted from sources not related to the Medley Farm site such as the Sprouse septic facilities or poor well head practices, analysis of samples collected from the Sprouse well would not provide any additional conclusive data. The Sprouses will be contacted to obtain permission to measure the total depth and depth to ground-water of the Sprouse well. Piezometer PZ101 will also be installed to confirm that the Sprouse well is upgradient of the site. This data will be evaluated to determine if any other action is required. This approach was discussed during our conference call on August 9, 1990.

23	Page 20, Table 2.6	See response to Comments #15 and #17.
24	Page 23, 3.2	The proposed sampling locations were based upon a 100 foot grid over the former disposal area which was modified based upon knowledge of site conditions to provide samples representative of overall site conditions (i.e. areas covered by fill placed during the emergency removal action as well as former lagoon and drum disposal sites where no fill is present and erosion has occurred). This approach was agreed upon during our phone conversation of August 8, 1990.
25	Page 23, 3.2	As agreed upon during our phone conversation of August 8, 1990, three of the surface soil samples collected from the former disposal area will be subjected to TAL metals analysis in addition to the three background surface soil samples.
26	Page 24, 4.0	An additional bedrock well will be installed in the vicinity of SW3 or at the preferred site Northeast of SW3, between the former disposal area and the intermittent creek. The actual location, however, will be based upon accessibility. Since existing data indicate that groundwater has been impacted in this area, Sirrine does not see any need for an additional saprolite well between SW3 and SW4. These points were discussed and agreed upon during our conference call of August 9, 1990.

27	Page 24, 4.0	All drilling procedures will be in accordance with the approved POP. This generally involves installing saprolite wells through hollow stem augers and continuous bedrock coring for bedrock well construction.
28(a)	Page 24, 4.2	If a ground-water sample cannot be collected with the Hydropunch™ at a specific location, a saprolite well or saprolite/bedrock well pair will be installed at the designed location. This was agreed upon during our conference call on August 9, 1990.
28(b)	Page 24, 4.2	The density of piedmont saprolites is too great to push the Hydropunch™ from the surface to the depths required at the Medley Farm site. Hollow stem augers will, therefore, be utilized to advance a borehole to approximately five feet below the water table to facilitate the collection of ground-water samples with the Hydropunch™.
29 & 30	Page 25, 4.2	PVC piezometers will be installed for ground-water level measurement in all Hydropunch™ boreholes after ground-water sampling has been accomplished. These piezometers will include silica filter packs, bentonite and neat cement seals and protective casings. These installations will be constructed in accordance with applicable SCDHEC and EPA well construction regulations.
31	Page 25, 4.3	The proposed total depth of bedrock well BW105 has been limited to 50 feet to minimize the potential for creating a preferential pathway for the vertical migration of contaminants into a portion of the

bedrock aquifer which may not be impacted. If the discrete zone sampling of ground-water from fractures in the lower portion of the bedrock corehole at BW105 indicate that contaminants are present, recommendations will be made to EPA to further assess the vertical extent of contamination at that location.

This was agreed upon during our conference call on August 9, 1990.

32 Page 25, 4.3

The length of core runs and feed pressure, etc. will be adjusted as required to maximize core recovery. Fracture zones will then be identified based upon subsequent hydraulic (water pressure) testing. Based on Sirrine's experience on similar sites in the South Carolina Piedmont, the use of geophysical logging is unnecessary using this approach.

This was discussed during our conference call on August 9, 1990.

33

Holding times will be monitored carefully to assure that sample extraction and analysis is performed within the recommended time frames.

34 Page 27, 4.3

The need for abandoning a portion of this bedrock corehole will be determined by the Steering Committee based upon Sirrine's recommendations depending upon the variations in contaminant concentrations observed in the analyses of ground-water samples collected from discrete fracture zones.

See response to Comment #31.

35	Page 27, 4.4	The statements and arrows included on Figure 4.1 provide the rationale for where wells will be installed. In all cases, if water is not encountered in the saprolite, a bedrock well will be installed at the designated location.
36	Page 27, 4.4	An additional saprolite well will be installed and sampled at the toe of the steep slope NE of existing well SW3. The location will be in the general vicinity of proposed stream gaging stations SL3 and SL4, SW of the creek. Well construction specifications at this location will be in accordance with the approved P.O.P. Well installation, however, may be accomplished using hand tools and/or a portable tripod and drilling casing due to difficult access at this site. Well installation equipment will be subjected to the approved decontamination procedures. Construction methods will be documented in the field log book for this project. Samples collected from this well will be analyzed for VOC's. EPA concurred with this approach during our conference call of August 9, 1990. A bedrock well will be installed adjacent to SW3 or at a location Northwest of SW3. The actual location will be based upon accessibility. See response to Comment #26.
37	Page 28, 4.4	Based upon the installation and sampling of the additional saprolite well proposed in the response to Comment #36, these additional surface water/sediment samples are not necessary. EPA concurred with this approach during our conference call of August 9, 12990.

38	Page 28, 4.4	If VOC's are detected in groundwater at HP103, monitoring well SW106/BW106 will be used to define the extent of the contaminant plume in this direction. The concentrations of contaminants detected at HP103 will be used to evaluate contaminant migration and attenuation in the saprolite aquifer in reference to concentrations observed at SW4. Proposed monitoring wells SW103/BW103 will not be installed in this scenario. This approach was discussed and agreed upon during our conference call on August 9, 1990.
39	Page 29, Figure 4.1	The results of the analysis of ground-water samples collected form HP104 will be used to evaluate the presence of contaminants in the saprolite aquifer southwest of existing well SW4. A piezometer will also be installed in the completed Hydropunch boring to evaluate whether or not there is a component of ground-water flow southwest from SW4. If ground-water is present in the saprolite aquifer and there is a component of flow in this direction, a bedrock well has not been proposed. Based upon the levels of contaminants at SW4 and the nature (relative densities) of the contaminants detected, sampling and analysis of ground-water from the saprolite aquifer should provide adequate screening. A bedrock well will be installed if ground-water is not encountered in the saprolite. A saprolite/bedrock well pair will be installed if contaminants are detected at HP104. This approach was discussed and agreed upon during our conference call on August 9, 1990.
40	Page 29, Figure 4.1	We concur with the recommendation regarding the placement of well pair SW107/BW107.

3 4 0257

41	Page 27 Section 4.4	See response to Comments #22.
42	Page 30 Top of Page	See response to Comments 22 and 41.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

MAY 16 1989

4WD-SFB

3 4 0258

Mr. Les Oakes
King & Spalding
2500 Trust Company Tower
Atlanta, GA 30303

Re: Approval of Medley Farms Project Operations Plan with Caveat on Cleaning Procedures for Drilling (Down-hole) Equipment

Dear Mr. Oakes:

I shared Sirrine's April 21, 1989 letter with Region IV Environmental Services Division (ESD). ESD is in agreement with the language in Sirrine's letter. The Medley Farm Work Plan dated August 1988 and Project Operations Plan (POP) dated January 1989 are approved with the understanding that an alterate cleaning procedure will be used to decon the drilling (down-hole) equipment. It is also the Agency's understanding that additional rinsate samples for quality control/quality assurance purposes will be collected during the cleaning process for analysis. If this is your understanding as well, no response is necessary from the Potentially Responsible Parties.

Sincerely yours,

Jon K. Bornholm

Jon K. Bornholm
Superfund Project Manager

cc: Ken Barry, Versar
Donald Hunter, ESD
Coleman Miles, Jr., SCDHEC
Gordon Peterson, Sirrine

SIRRINE
ENVIRONMENTAL
CONSULTANTS

Post Office Box 24000
Greenville, South Carolina 29616
(803) 234-3000

3 4 0259

April 21, 1989

Mr. Jon Bornholm
USEPA - Region IV
Superfund Project Manager
345 Courtland Street
Atlanta, GA 30365

Re: Medley Farms Site POP - G8026

Dear Jon:

After discussing your letter of April 4, 1989 on the POP for the Medley Farms Site with the PRP's it was determined that further clarification was in order before proceeding with the field activities. Concerns were raised as to the interpretation that could be made of your response letter. Both Sirrine and the PRP's want to ensure that we are clearly understanding EPA's position on the field cleaning procedures. It is our understanding that all elements of the Work Plan and POP have been approved with the exception of the field cleaning procedures for the "downhole" drilling equipment. As a point of clarification, the POP has been amended to utilize the ESD suggested cleaning protocols for all sampling equipment split spoons, hand augers, etc. A limited number of installations are being made at this site. In addition, the nature of the site is such that the staging of facilities for large equipment isopropanol rinses, storage of equipment, storage of chemicals and waste drums is difficult. No buildings or covered facilities are available. With this in mind, the costs of the additional rinsing for drilling equipment would become a significant portion of the overall costs. On numerous other sites under various regulatory programs, SEC has found careful steam cleaning as an acceptable method of preparing drilling equipment between installations. It is our understanding that the additional split samples will serve to substantiate the effectiveness of the cleaning efforts. Under these conditions, we would not anticipate the need to redo specific RI efforts unless the PRP's wished further confirmation of a result detected in the environmental samples. We would like to request that if this is your understanding of the situation, that the POP be signed with a footnote delineating the exception taken on the cleaning of the drilling equipment.

3 4 02(1)

If there are any problems, please contact myself or the PRP's.

Sincerely,

Gordon A. Peterson
Project Manager

dew/L8026JB.GAP

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3 4 0261

October 4, 1990

BY FEDERAL EXPRESS

Mr. Jon K. Bornholm
Remedial Project Manager
United States Environmental
Protection Agency, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Re: Medley Farm Site -- Phase II RI Work Plan

Dear Mr. Bornholm:

This letter is to correct a typographical error in the Medley Farm Site Steering Committee's response to EPA's comments on the Work Plan for the Phase II Remedial Investigation at the Medley Farm Site. In our letter to you, dated August 27, 1990, on page 2 in the second full paragraph, we discuss locating an additional bedrock well at a location "northwest" of SW-3. "Northwest" should read "northeast". On page 8 of the point-by-point response to the comments, prepared by Sirrine Environmental, in the last paragraph of our response to Comment No. 36, the same well is referred to, and again "northwest" should read "northeast".

If you have any questions regarding this matter, please contact me.

Sincerely,

Mary Jane Norville

Mary Jane Norville

MJN/da
39004.44003

cc: Mr. Gary Stewart, SCDHEC
Mr. Jim Chamness

Attachment C

South Carolina Department of Health and Environmental Control Comments
on Medley Farm Draft RI Phase II Work Plan

South Carolina DHEC
Department of Health and Environmental Control

3 4 0263

August 20, 1990

Ms. Mary Jane Norville
King & Spalding
2500 Trust Company Tower
Atlanta, GA 30303

RE: Comments on Draft Phase II RI/FS Work Plan for the Medley Farm Site.

Dear Ms. Norville:

This letter is to notify you and the Medley Farm Steering Committee that EPA's letter dated August 10, 1990 did not include comments from the South Carolina Department of Health and Environmental Control. A copy of the State's review comments on the Draft Phase II RI/FS Work Plan is hereby attached. Also, a copy of this letter and the attached comments are being sent to EPA, Region IV. I would like to stress that it is in the best interest of all parties, especially the PRP's and the steering committee, to ensure that all of the State's concerns and comments are adequately addressed. Failure to do so may result in a State action pursuant to the South Carolina Pollution Control Act and the South Carolina Hazardous Waste Management Act.

The State looks forward to working with you to ensure the remedial action at the Medley Farm Site is effective.

If you have any questions please give me a call at (803)734-5486.

Sincerely,

Gary Stewart

Gary Stewart
Site Engineering Section
Bureau of Solid & Hazardous Waste Management

GS/njw

Attachments

cc: Keith Lindler
Angela Gorman
Cindy Mason
File

2600 Bull Street Columbia, South Carolina 29201

South Carolina
DHEC
Department of Health and Environmental Control

3 4 0264

July 31, 1990

Jon Bornholm
Remedial Project Manager
EPA, Region IV
345 Courtland St.
Atlanta, GA 30365

RE: Medley Farms Draft RI Phase II Workplan

Dear Mr. Bornholm:

After reviewing the above mentioned document, SCDHEC has the following comments:

General Comment:

This Department feels that the PCB contamination at this site is at levels that could present future health problems. Attached is a memo from Doug Blansit, of Health Hazard Evaluation, expressing concerns of PCB contamination at the site. Therefore, the Department believes that PCB analysis should be preformed on all surface soil sampling done during Phase II RI.

The Department believes more groundvater wells are needed in areas to the north and northeast of the site. As SW3 showed contamination, this area needs to be investigated more thoroughly. The placement of new wells around SW3 was agreed upon by Sirrine at the June 8, 1990 meeting in Atlanta on the Draft RI.

Specific Comments:

Page 6, Conclusions of Phase I, RI

Under the third bullet, PCB's need to be included to contaminants found in soils. The eighth bullet needs to be revritten, this should state that inorganics were detected at low levels.

Page 13, Section 2.3

SCDHEC needs a copy of the revised tables of inorganic compounds in soils and groundvater. The need for additional inorganic analyses will be decided by EPA and SCDHEC.

Page 13, Section 2.3.1

Significant levels of PCB's are present in the soils at Medley Farms. See general comment for further explanation.

Page 14, Section 2.3.1

The three surface soil samples for inorganic analyses should be required. The identification numbers of these samples should be included.

Page 15, Section 2.3.2

The existing background wells (SW1 and BW1) need to be sampled for inorganics during Phase II.

Page 19, Section 3.1

Surface soil sample HA14 is off-site, do the PRP's have an access agreement?

Sincerely,

Richard Haynes

Richard Haynes
Site Engineering Section
Bureau of Solid and Hazardous Waste Management

RH/njw

cc: Keith Lindler

3 4 0266

MEMORANDUM

June 13, 1990

TO: RICHARD HAYNES
BUREAU OF SOLID AND HAZARDOUS WASTE MANAGEMENT

FROM: DOUG BLANSIT DB
HEALTH HAZARD EVALUATION

THROUGH: JOHN BROWN, DVM, PhD JB
STATE TOXICOLOGIST

RE: PCBs AT MEDLEY SITE

As you requested, I am providing the following information on the presence of PCBs at the Medley Site near Gaffney, SC. Please contact me at (803)737-4170 if I may be of any further service.

1. Aroclors are mixtures of various chlorinated compounds. In the case of Aroclor 1254 and Aroclor 1260, the compounds are biphenyls. The ..54 and ..60 denote that the compounds contain 54% and 60% chlorine by weight.

2. In the March 1990 Draft Remedial Investigation, Sirrine Environmental Consultants report that PCBs were detected in soil throughout the Medley Site. Maximum concentrations of Aroclor 1254 (5.379 mg/kg) and Aroclor 1260 (0.594 mg/kg) occurred in test pits 2-1 and 4-1, respectively. Readings from an organic vapor analyzer (OVA) determined sampling locations within the test pits. Neither surface soil samples (0" to 1") nor off-site soil samples could be located.

The level of PCB contamination may be greater than these data indicate. Considering the relatively low volatility of PCBs, the relatively high volatility of other organic compounds present, the relatively low tendency of PCBs to migrate within the soil, the relatively high tendency of other organic compounds present to migrate within the soil, the use of an OVA to detect areas of contamination within the pits, and the past presence of several drums of PCBs at the site, the concentrations of PCBS at the soil surface are likely to be greater than the previously detected sub-surface concentrations of PCBs.

3. ATSDR has published a Draft Toxicological Profile for Selected PCBs. It states, "EPA calculated a human $q1^*$ of 7.7 $(mg/kg/day)^{-1}$. Because there is no information regarding which constituents of any PCB mixture might be carcinogenic, Aroclor 1260 is assumed to be representative of other mixtures, and this potency estimate applies to them as well." The EPA Carcinogen Assessment Group classifies PCBs in Group B2, probable human carcinogens.

4. Using ATSDR's assumptions of a 70 kilogram adult ingesting 0.05 grams of soil per day, soil containing 5.379 mg/kg PCBs would provide an exposure of $3.8 * 10^{-6}$ mg PCBs/kg/day. The estimate of the lifetime excess risk of contacting cancer as a result of this exposure is $3 * 10^{-5}$. Because of the conservative assumptions used in Risk Assessment methodology, the actual risk may be much lower and may actually be zero.

CONCLUSION

5. Data are not adequate for the assessment of the public health risk resulting from PCBs within soils at the Medley Site. Past analyses nave not addressed contaminant concentrations in surface soil nor have past analyses addressed the presence of PCBs on neighboring property.

6. The preliminary data indicate, however, a need for further investigation. Specifically, the carcinogenic risk resulting from an exposure to this soil and the probability that surface-soil PCB concentrations may be greater than indicated provide a cause for concern.

7. The Division of Health Hazard Evaluation is currently in the process of writting a Health Assessment for this site.

South Carolina
DHEC
Department of Health and Environmental Control

3 4 0268

MEMORANDUM

TO: Richard Haynes
Site Engineering Section
Division of Site Engineering and Screening
Bureau of Solid and Hazardous Waste Management

FROM: Angela Gorman, Hydrologist AG
Superfund and Solid Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous Waste Management

DATE: August 17, 1990

RE: Phase II RI/FS Work Plan
Medley Farm Site
SCD 980 558 142
Cherokee County

The referenced plan has been reviewed from a hydrogeologic perspective as requested. The plan appears to address many of the hydrogeologic issues which were identified as needing further investigation based on the Phase 1 data. However, several additions and revisions to the plan are recommended to ensure a thorough investigation. The items which appear to need revision include analytical procedures for groundwater samples, the use of the Hydropunch, and assessment activities northeast of the disposal area. Specific comments concerning these issues are provided below.

1) Page 14 - Groundwater Analytical Parameters
The restriction of groundwater analytical parameters to TCL volatile organic compounds may not allow a thorough assessment of contaminants in groundwater. Only one comprehensive analysis (for volatile organic compounds, semi-volatile organic compounds, pesticides and PCB's) was conducted during the Phase 1A investigation, and only four of the existing monitoring wells were sampled. Volatile organic compounds were the only constituents detected above quantitative detection limits during this single sampling event, and subsequent analyses have included only volatile organic compounds. Because semi-volatile organic compounds, PCBs and pesticides have been detected in soils at the site, it appears that additional analyses of groundwater for these constituents is warranted.

2) Page 14 - Groundwater Analyses
Analysis of more than one round of groundwater samples during the Phase II investigation may be required to adequately characterize groundwater quality, and to allow determination of suitable remedial activities.

3) Page 15 - TAL Inorganic Analysis of Groundwater
Filtration of groundwater samples collected for analysis of TAL inorganics from monitoring wells SW1 and BW1 is proposed. Analysis for total metals is recommended due to the potential for removal of mobile constituents by filtering. Additionally, consistent sampling procedures are necessary to obtain interpretable results. Reports of analytical results from Phase 1A and 1B of the Remedial Investigation do not specify that samples were filtered, nor is filtering included in the groundwater sample collection procedures specified in the Project Operation Plan (January 1989). If samples are to be filtered, duplicate non-filtered samples should also be collected and analyzed.

4) Figure 4.1 - Use of Hydropunch
The proposed use of groundwater analytical results collected with Hydropunch technology is acceptable to aid in the placement of saprolite monitoring wells (e.g., HP101). However, due to inherent uncertainties of the proposed procedure (possible aeration of samples collected with the Hydropunch and proposed non-CLP analysis of the samples) this procedure should not be used to indicate the presence/absence of contamination in a particular area. Additionally, Hydropunch samples collected from the saprolite zone will not provide an indication of groundwater quality within the bedrock zone. Therefore, analytical results from HP102, HP103, and HP104 should be used to determine appropriate placement for additional monitoring wells, but they should not be used to determine whether or not a monitoring well should be installed in a particular area of the site.

5) Page 25 - Bedrock Aquifer
The proposed bedrock wells should provide information regarding groundwater quality and the hydraulic relationship between the saprolite and bedrock zones. However, only limited provisions are included in the workplan for analysis of groundwater within discrete bedrock fracture zones, and no provisions are included for evaluating the hydraulic relationship between discrete fracture zones. These issues should be addressed.

6) Page 27 - Analysis of Groundwater Samples from BW105
It is agreed that CLP analysis is needed to confirm the presence of "clean" groundwater in discrete fracture zones as proposed for monitoring well BW105. However, it appears contradictory to also propose abandonment of portions of the BW105 drill hole based on non-CLP analytical results. An explanation for this apparent discrepancy and reasons for the proposed abandonment are needed.

7) Page 27 - Monitoring NE of Former Disposal Area
The presence of difficult access conditions in the area northeast of the former disposal area is recognized. However, at a minimum, a companion bedrock well to SW3 appears to be necessary to adequately define the hydrologic relation between saprolite and bedrock, and to investigate groundwater quality in bedrock in this portion of the site.

8) Page 28 - Evaluation of Groundwater Flow Patterns NE of Former Disposal Area
Although the tributary northeast of the site may represent baseflow during dry periods, additional data and discussion are needed to adequately characterize the groundwater flow patterns in this area of the site. Water level data from a bedrock well installed at the SW3 location should aid in this hydrologic characterization. However, demonstration of groundwater quality downgradient of SW3 may not be feasible without monitoring wells because the surface water quality in the tributary to Jones Creek may not adequately represent the quality of groundwater within bedrock.

9) Page 29 - Piezometer PZ-101
Piezometer PZ-101 should be constructed as a permanent monitoring well to enable collection of representative groundwater samples should future investigative results indicate such a need.

Attachment D

Medley Farm Site Steering Committee Response to SCDHEC Comments

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3 4 0272

October 4, 1990

BY FEDERAL EXPRESS

Mr. Gary Stewart
Bureau of Solid and
Hazardous Waste Management
South Carolina Department of
Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Re: Medley Farm Site

Dear Mr. Stewart:

I am writing on behalf of the Medley Farm Site Steering Committee in response to the comments we received from the South Carolina Department of Health and Environmental Control (SCDHEC) on the Phase II RI/FS Work Plan for the Medley Farm Site. The Medley Farm Site Steering Committee received comments from the U.S. Environmental Protection Agency (EPA) on August 10, 1990. Conference calls were held on August 8 and August 10 to discuss questions and concerns about the work proposed in the Plan. Jon Bornholm, with EPA, told us he had attempted to reach someone at SCDHEC to participate in those calls. Unfortunately, SCDHEC was not able to participate in the calls or to submit written comments until late August. However, Jon Bornholm, the Steering Committee and our consultants all have been conscious of the concerns which SCDHEC expressed in the past and tried to anticipate your comments on the Phase II Work Plan.

Because the State's comments were similar to EPA's, we believe that your concerns were addressed in our response to EPA's comments. You were sent a copy of our written response to EPA and a copy of a letter to Jon Bornholm confirming the agreements we reached with EPA for responding to these concerns. Another copy of these items is enclosed. As the work has progressed, the Steering Committee has continued to evaluate the Phase II RI with EPA's and the State's concerns in mind. As a result of those evaluations, the Steering Committee has decided to take additional action to address issues raised in EPA's and the State's comments. Two additional bedrock wells will be installed at depths of

approximately 200 feet to verify the vertical extent of contamination. These additional wells will be located next to BW-105 and BW-2. In addition, we will take twelve surficial soil samples and analyze these samples for PCBs.

The work at the Site is progressing on schedule. If you have questions regarding the work, or any other matter related to the Medley Farm Site, please contact me at (404) 572-3585.

Sincerely,

Mary Jane Norville

Mary Jane Norville

MJN/111
Enclosures
cc: Mr. Jon Bornholm

OVERSIZED

DOCUMENT